

WE CLAIM:

1. A method of removing natural gas liquids from a gaseous natural gas stream at elevated pressure to produce a gaseous product stream having a reduced content of natural gas liquids, which method comprises the steps of:
  - (a) cooling the natural gas stream;
  - (b) introducing said cooled natural gas stream into the bottom of a scrub column that has a lower stripping section and an upper absorption section, each section containing at least one theoretical stage;
  - (c) allowing natural gas to rise through the scrub column, and removing from the top of the scrub column an overhead stream;
  - (d) partly condensing the overhead stream, and separating said partly condensed overhead stream into a gaseous stream having a reduced content of natural gas liquids and a liquid reflux stream, and removing the gaseous stream as the gaseous product stream having a reduced content of natural gas liquids;
  - (e) splitting the liquid reflux stream into a first reflux stream and a second reflux stream;
  - (f) introducing the first reflux stream into the top of the absorption section of the scrub column;
  - (g) introducing the second reflux stream into the top of the stripping section to strip the desired light gaseous components; and
  - (h) removing from the bottom of the scrub column a liquid bottom stream rich in heavier components.
2. The method of claim 1 wherein partly condensing the overhead stream in step (d) is cooled by indirect heat exchange with at least part of the gaseous product stream.

3. The method of claim 1 further comprising introducing the liquid bottom stream at a lower pressure in the top of a stripping column having at least one theoretical separation stage; removing from the bottom of the stripping column a liquid stream of which a part is vaporized, which part is introduced into the bottom of the stripping column; removing from the top of the stripping column a gaseous overhead stream; partly condensing the gaseous overhead stream and separating the partly condensed overhead stream into a liquid fraction and a gaseous fraction; introducing the liquid fraction into the top of the stripping column; and adding the gaseous overhead fraction to the gaseous product stream.
4. The method of claim 3 wherein partly condensing the overhead stream in step (d) is cooled by indirect heat exchange with at least part of the gaseous product stream.
5. The method of claim 3 wherein the gaseous overhead is partly condensed by indirect heat exchange with the gaseous product stream.
6. The method of claim 4 wherein the gaseous overhead is partly condensed by indirect heat exchange with the gaseous product stream.
7. The method of claim 3 wherein the liquid bottom stream from the scrub column is cooled by indirect exchange with the gaseous product stream.
8. The method of claim 4 wherein the liquid bottom stream from the scrub column is cooled by indirect exchange with the gaseous product stream.
9. The method of claim 5 wherein the liquid bottom stream from the scrub column is cooled by indirect exchange with the gaseous product stream.
10. The method of claim 6 wherein the liquid bottom stream from the scrub column is cooled by indirect exchange with the gaseous product stream.

11. The method of claim 1 wherein the natural gas stream is partly condensed by indirect heat exchange with the gaseous product stream.
12. The method of claim 2 wherein the natural gas stream is partly condensed by indirect heat exchange with the gaseous product stream.
13. The method of claim 3 wherein the natural gas stream is partly condensed by indirect heat exchange with the gaseous product stream.
14. The method of claim 4 wherein the natural gas stream is partly condensed by indirect heat exchange with the gaseous product stream.
15. The method of claim 5 wherein the natural gas stream is partly condensed by indirect heat exchange with the gaseous product stream.
16. The method of claim 6 wherein the natural gas stream is partly condensed by indirect heat exchange with the gaseous product stream.
17. The method of claim 7 wherein the natural gas stream is partly condensed by indirect heat exchange with the gaseous product stream.
18. The method of claim 8 wherein the natural gas stream is partly condensed by indirect heat exchange with the gaseous product stream.
19. The method of claim 9 wherein the natural gas stream is partly condensed by indirect heat exchange with the gaseous product stream.
20. The method of claim 10 wherein the natural gas stream is partly condensed by indirect heat exchange with the gaseous product stream.
21. The method of claim 1 further comprising introducing hydrocarbon liquid into the top of the absorption section.
22. The method of claim 3 further comprising introducing hydrocarbon liquid into the top of the absorption section.

23. The method of claim 4 further comprising introducing hydrocarbon liquid into the top of the absorption section.
24. The method of claim 5 further comprising introducing hydrocarbon liquid into the top of the absorption section.
25. The method of claim 6 further comprising introducing hydrocarbon liquid into the top of the absorption section.
26. The method of claim 7 further comprising introducing hydrocarbon liquid into the top of the absorption section.
27. The method of claim 11 further comprising introducing hydrocarbon liquid into the top of the absorption section.
28. The method of claim 22 wherein the hydrocarbon liquid is cooled by indirect heat exchange with the gaseous overhead fraction.
29. The method of claim 23 wherein the hydrocarbon liquid is cooled by indirect heat exchange with the gaseous overhead fraction.
30. The method of claim 24 wherein the hydrocarbon liquid is cooled by indirect heat exchange with the gaseous overhead fraction.
31. The method of claim 25 wherein the hydrocarbon liquid is cooled by indirect heat exchange with the gaseous overhead fraction.
32. The method of claim 26 wherein the hydrocarbon liquid is cooled by indirect heat exchange with the gaseous overhead fraction.
33. The method of claim 27 wherein the hydrocarbon liquid is cooled by indirect heat exchange with the gaseous overhead fraction.